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## International Journal of Agricultural Sciences

ISSN: 2598 – 1145 (online)

# The Impact of Community Based Critical Land and Water Resources Management Program on Community Welfare (Case in Nagari Tanjuang Bonai, Lintau Buo, Tanah Datar, West Sumatera)

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### ARTICLE INFORMATION

#### Article history:

Received: 27 January 2019

Revised: 13 May 2019

Accepted: 07 June 2019

#### Keywords:

Agroforestry, participatory, local wisdom, Lintau Buo

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### ABSTRACT

Community Based - Critical Land and Water Resources Management Program is a program to handle critical land and poverty alleviation in Indonesia. The objective of this program is to improve the condition of the poor living surrounding critical land forests. Participatory approach is employed in this program by involving multi-stakeholders to improve critical land to become productive land in order to increase income and welfare of the community. The purpose of this study was to analyze the impact of Community Based - Critical Land and Water Resources Management Program on community's income who were directly involved in managing the critical land. This study uses a case study approach with application of descriptive quantitative and qualitative method in data analysis. Nagari Tanjuang Bonai, Lintau Buo Utara District, Tanah Datar District, West Sumatra Province was purposively selected as research location. The respondents were 32 farmers who are members of Sago Lestari farmer group (Poktan) as program implementers from 2012 to 2016. The primary data were collected using questionnaires from farmers, while interview guide was used to obtain information from key informants. The results of this study indicate that the program has been able to provide benefits to community in form of increasing in farmers' income. The average income increases by 34.11% of the total farmers' income participating in the program. This implies that the program has been able to improve the community's welfare. It indirectly reduces the area of critical land and change it into productive land.

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## INTRODUCTION

Development is a systematic and continuous effort to create conditions and provide alternatives for community to achieve humanistic aspirations. Anwar (2005) states that regional development is carried out to achieve development goals including growth, equity and sustainability with location dimension and related to the

socio-economic aspects of the region. In mapping the regional development, the region is expected to have strategic elements including natural resources, human resources and infrastructure that are interrelated and complementary to be developed optimally by considering the nature of synergism. Rural development is rural-based development by prioritizing the local wisdom of rural areas which includes the demographic structure of

society, social cultural characteristics, physical/geographical characteristics, patterns of agricultural business activities, patterns of rural-urban economic linkages, village institutional sectors and characteristics of residential areas (Suyitno, 2004 ).

The fundamental problems in rural development or agricultural development are: (1) limited land ownership, (2) low income, (3) low land productivity, (3) a lot of sleep or critical land. Critical land management is a strategic solution to solve problems. According to the Ministry of Forestry, critical land is a land with physical condition of not function properly according to its designation as a production medium or a water system. Nowadays, the condition of land resources and agricultural environment in Indonesia has suffered significant damage. In the beginning of 2000, the area of critical land in Indonesia was recorded about 23.25 million ha, and in 2012 it increased to about 52.25 million hectares (Ditjen Bangda, 2012). The area of critical land in West Sumatra is about 369,507 hectares, but only 214,580 hectares have been surveyed. Of the total of critical land surveyed, 137,490 hectares are outside the forest area and 77,090 hectares in the forest area (West Sumatra Forestry Service, 2016)

Indonesian Government have addressed the problem of critical land since 1969 through the Presidential Instruction on Reforestation and Greening. In 1998 the Ministry of Forestry launched many programs such as through community forestry, industrial plantations, national movements for national forest and land rehabilitation. This activity has not achieved optimal results because all the efforts were done on the basis of the government's desire (Top Down) is not the desire of the community around the land (Bottom Up), and its implementation was given to the private sectors that had plants oriented instead of the environment and the existing community around the land.

This is the reason of the Directorate General of Bina Bangda of the Ministry of Home Affairs to implement the Community Based - Critical Land and Water Resources Management Program (Program Pengembangan Penanganan Lahan Kritis dan Sumber Daya Air Berbasis Masyarakat = PLKSDA-BM). The development of critical land handling does not only need to pay attention to the environmental aspects of the forest, land and water, but also the aspects of society within the circumference of the environment.

The aim of this program is to improve the land potentially critical to be productive land to produce economic value in order to improve the welfare of the poor by involving multi-stakeholders (government, communities, universities, and NGOs) with objectives, including: a) Increased land productivity at the pilot project location; b) The creation of a water catchment area; c) Increased community / farmer income of program participants and other parties involved in the program over the long term, d) Strengthening of Institutional and Empowerment of Farmer Groups in critical land management; e) Increase multiparty cooperation and increases public participation in government programs; f) Increased local revenue (PAD) from the results of land productivity.

Theoretically handling of community-based critical land is beneficial for lifting economic growth of the community, especially those who are directly involved, or live around the critical land. However, the theory is not known well. Since the launching of the PLKSDA-BM program in West Sumatra in 2012, until now there has been no research that suggests the development and impact on increasing the income of the participating community. Based on above overview, it is required to study on the implementation of Community Based - Critical Land and Water Resources Management Program (PLKSDA-BM) and its impact on community.

Some of the main questions that must be answered in this study are: (1). How is the impact of PLKSDA-BM program on the income of the community, (2) What are the problems faced by the community in the PLKSDA-BM program to increase their income.

The purpose of this study is: (1) Knowing the impact of the PLKSDA-BM program on the income of the people directly involved in Nagari Tanjung Bonai, Lintau Buo Utara District, Tanah Datar Regency; (b) Identifying problems faced by the community in increasing income in the PLKSDA-BM Program in Nagari Tanjung Bonai, District Lintau Buo Utara, Tanah Datar District.

This research is expected to contribute in the development of science related to the increase of people's income from critical land. It can be a reference in the implementation of PLKSDA-BM Program in the future. It can be the basis for formulating policies in handling community-based critical land.

## RESEARCH METHODS

This research was carried out in Nagari Tanjuang Bonai, Lintau Buo Utara Subdistrict Tanah Datar District. The research site was selected purposively, based on the location of PLKSDA-BM program in Tanah Datar District.

This study used a case study method. According to Maxfield (1970) in Nazir (2003) the case study method is a research method with regard to a specific or typical phase of the overall personality. Research subjects can be individuals, groups, institutions, and society. The purpose of the case study is to provide a detailed description of the background, traits and characteristics that are typical of the case that will be made a general thing.

The population in this study were farmers participating in the PLKSDA-BM Program in Nagari Tanjuang Bonai, Lintau Buo Utara Subdistrict, Tanah Datar District, which was joined by the Sago Lestari Farmers Group as many as 32 people. All this farmer group members were involved as respondents in this study.

Questionnaires and interview guides are intended to obtain qualitative and quantitative data concerning the activities of the PLKSDA-BM Program conducted by the community. Questionnaires were used to interview participant farmers of the PLKSDA-BM program in Nagari Tanjuang Bonai, District Lintau Buo Utara, Tanah Datar District. Interviews with key informants is to know about the implementation of the PLKSDA-BM program through Focus Group Discussion (FGD). Key Informants were chosen purposively consisting of Department of Related Institution, Walinagari, Wali Jorong, Community Leader and Customary Figure.

Secondary data were collected from Bappeda of West Sumatra Province, Bappeda of Tanah Datar Regency, Department of Food Crops and Horticulture of West Sumatra Province, West Sumatra BKSDA, Department of Food Crops and Horticulture Tanah Datar District, Kanagarian Tanjuang Bonai and BPS as well as documents related to the PLKSDA-BM program and data taken through literature studies.

Variables and indicators measured in this study are: farm revenue, farm costs, farm income, total household income, and influencing factors and problems faced by the community including physical problem economy problem cultural problem, and social problem

Data are analysed using Descriptive Quantitative and Qualitative method. Quantitative Descriptive Analysis is used to see the impact of the PLKSDA-BM Program on income of farmers participating in the program in Nagari Tanjuang Bonai, Lintau Buo Utara District, Tanah Datar Regency. The data analysed concerns the type of farming and the income received by farmers participating in the PLKSDA-BM Program.

Income from PLKSDA-BM is income derived from farming activities carried out at the location of the program activity. The income of PLKSDA-BM is the total revenue from the production of crops at the PLKSDA-BM land minus the total cost paid.

Revenue is the amount of money received by farmers from selling production of farm crops in the PLKSDA-BM land. Production of PLKSDA-BM land is the total crop production located PLKSDA-BM program site. Price is the selling value of PLKSDA-BM farm products received by farmers. The total cost is the direct costs used in the production process, namely the purchase price of seeds, fertilizer, chemicals, wages of hired workers, taxes and other farm expenditure.

According to Soekartawi (2004) mathematically revenue can be formulated as follows:

$$TR = P_y \cdot Y \quad (1)$$

Where: TR = Total revenue (Rp)

$P_y$  = Price of product (Rp/kg)

$Y$  = Production (kg)

While income is formulated as:

$$I = TR - TC \quad (2)$$

Where: I = Total farm income

TC = Total cost

Household income data was obtained through interview respondents using questionnaires, recorded based on recall. This household income data is to measure the farm income contribution from the PLKSDA-BM land to the household income of the participants of the PLKSDA-BM program during the month of 2017.

Descriptive qualitative analysis was used to see a general description of program implementation and problems

faced by the community in an effort to increase their income.

## RESULTS AND DISCUSSION

Implementation the program applies the concept of Agroforestry, which combines forestry and agriculture science, and integrates forestry efforts with rural development to create harmony between agricultural intensification and forest conservation (Hadi Susilo, 2009). King and Chamder (1978) in Arifin (2001) defines agroforestry as a land management system based on land conservation and improve overall results, combining the production of agricultural crops (including tree crops) and forest or animal plants integration on the same land unit and applying management methods in accordance with the culture of the local community.

Realizing this concept, the PLKSDA-BM program carries out a participatory pattern that synergizes with multi-stakeholders ranging from planning to implementation. The government acts only as facilitator. The location of activities proposed by the community together with the Nagari government and the type of planted commodity is determined according to the agreement of the community together with the local Nagari. The government only verifies and approves or does not approve in accordance with the established guidelines.

The location proposed by the community together with the Nagari and approved by the central government is in Jorong Gunung Modang Nagari Tanjuang Bonai, District Lintau, North Bu. Commodities proposed by the community and approved by the government are *Jeruk Siam Gunung Omeh* as the main crop and vegetables such as Chili, Eggplant, Beans, Radish, Tobacco as intercropping plants. The PLKSDA-BM program extended farmers' land in their operations (land on PLKSDA-BM site plus land prior to PLKSDA-BM program) because they have been granted the right to use the communal land for 20 years. This program provides a better hope when the main crop (orange) produce yield, while they currently do vegetable farming as a source of livelihood.

The results of the research reveal that revenue from oranges has not contributed to the income of farmers because the total revenue received was Rp. 44,313,000, or on average of Rp. 3,408,692 per hectare, while, the total expenditure during the year 2017 was Rp

70,273,000, or Rp 5.405,605,- per hectare. Costs incurred for the main crop is larger than the revenue received by each respondent, because they have orange that either bear the fruit for the first time and its fruit cannot be harvested at the same time. The loss from orange per hectare was Rp.1,996,923,-.

Interestingly, there is a various economic value of orange farming among the respondents. One respondent expended Rp. 7.450,000 130 tress of orange, while the crop yield was 670 kg and farmer received revenue of Rp. 7,090,000. Other farmer that also has 130 trees of oranges expended Rp. 1,600,000, - only produced yield of 20 kg with an income of Rp. 180,000. This condition proves that good maintenance of orange trees will provide good yields, because it is related to the amount of production, the quality of the fruit and the selling price.

The treatment of orange cultivation PLKSDA-BM in Nagari Tanjuang Bonai has not been optimal, because orange plants are the first time cultivated by local farmers. Farmers are not confidence to invest heavily on orange plants because it need long time to produce yield compared to vegetables farming they usually do.

The income from intercropping plants contributes as much of Rp. 583,285,000, - or Rp. 44,868,076 per hectare per year. The total income per year per hectare was Rp. 36,061,923. This means that the income from intercropped plants cover the cost of orange farming. The revenue of intercropping plants ranges from Rp.8.875.000 with land size of 0.18 ha to Rp. 88,300,000 with land size of 1.31 ha. The revenue of the intercropping plant is very much influenced by the area of land managed by the respondent, the type of commodity and the way of cultivating the crop and the selling price of the commodity at harvest.

Crops and vegetable farming were something that the community used to do in Jorong Tanjuang Modang, Nagari Tanjuang Bonai, even their main source of livelihood for decades. This happens because the natural resource available in Jorong Tanjuang Modang is only dry land due to undulating topography and located on the highest plateau in Nagari Tanjuang Bonai where no water source that can irrigate rice fields to grow rice. Planting vegetables and crops as intercropped plants on PLKSDA-BM land allow farmers to harvest their plant weekly or monthly to meet their needs.



Household income of respondents is not only from the PLKSDA-BM land, but also comes from: (a) other land previously managed by them, (b) farm labourers, (c) carpentry/services, (d) trading /stalls, (e) subsidies/assistance from children and families. The source of income of respondents other than PLKSDA-BM land is farm income before the existence of PLKSDA-BM land. Eight farmers (25.8%) sourced their household income from 3 types of businesses apart from the PLKSDA-BM land, 22 respondents (70.96%) sourced from 2 types of businesses, and 1 respondent farmer (3.22%) sourced his household income from 1 other source of income.

Monthly total household income from other than PLKSDA-BM land mainly sourced from other farm land (32.34%). Income received through farm workers contributes 14.91% to the household income, while the share of income from service, trading business activities, and transfer from family were 12.26%, 23.85%, and 16.63%, respectively.

Monthly household income from PLKSDA-BM ranged from Rp.2,374,083,- to Rp.9,159,166,- with an average of Rp.3,694,099. Average contribution of income from the land PLKSDA-BM land to total household income was 34.11% and the share ranged from 16.20% to 56.33%.

The share of income from PLKSDA-BM land was higher than that of farm income on other land. This is because farming practices on the PLKSDA-BM land was better than the cultivation on the other land, especially in land utilization (there are main crops and intercrops), the use of fertilizer, plant seeds used and plant maintenance. Based on this income analysis. This implies that the PLKSDA-BM program provides benefits for increasing the income of farmer participating in the program, even though the yields of main crops (oranges) have not been optimally received by participating farmers.

As the PLKSDA-BM program ended in 2016, meaning that since then there was no more central government assistance to fund development and implementation of program activities in the field. Sustainability is left to the district government to conduct guidance and allocate fund in the district budget. The absence of financial assistance for the PLKSDA-BM program activities from the central government and the limited capacity of the regency budget, the sustainability of the program

depended on Sago Lestari farmer group who was trained and assisted for four years.

The problems faced in the effort to develop main plants after the PLKSDA-BM program are quite complex. The physical problems are: (a) inadequate infrastructure and farm road, (b) inadequate means of telecommunication networks, (c) the absence of market infrastructure for buying and selling crops. Economic problems are: (a) farming capital for the maintenance of orange plants, (b) unclear marketing (not yet having a marketing network) and very high price fluctuations; (c) the price of fertilizer is expensive and difficult to obtain. Cultural problems are: (a) community have not felt the benefits of grouping in an effort to improve their economy, (b) the absence of Nagari regulations that support collaboration with communities in the management of Nagari ulayat lands. The social problems faced so far are that the Nagari government has not been able to cooperate with the community and the farmers' group (Poktan).

## CONCLUSION AND RECOMMENDATION

The PLKSDA-BM program in Nagari Tanjuang Bonai Kecamatan Lintau Buo Utara Tanah Datar District was implemented from 2012 to 2016. The implementation of PLKSDA-BM program places the community as the main actors of development (participatory), from preparation, planning to implementation. Implementing activities in the community field that are domiciled around the land belonging to the Sago Lestari Farmers Group (Poktan). The government acts as a facilitator that made the program implemented properly and smoothly. The program approach in the field applies the concept of Agroforestry, namely the existence of woody plants/ *Jeruk Gunung Omeh* and Horticulture plants (vegetables). Post-program (in 2017), activities in the location are still going on in the form of plant cultivation by farmer group and guided / monitored by Nagari and Regency governments.

PLKSDA-BM program benefits to increase the income of community on average of Rp 1.260.228, - per month or 34.11% of the total income of farmer household. After the program many problems become obstacles and challenges for farmers to maintain and develop the PLKSDA-BM program, such as inadequate road access to the location, lack of technical cultivation, basic maintenance, lack of capital, expensive production facilities and difficult to obtain market for the produce.

The District Coordination Team (Bappeda) can work together with the District Technical Team (Office of Related Agencies) to place their programs at the location of the PLKSDA-BM Nagari Tanjuang Bonai, Lintau Buo Utara Subdistrict, to continue coaching, training and mentoring to farmers and communities as well as the physical development of facilities and infrastructure to support the acceleration of the development of independent community-based critical land management. With the concept and pattern of implementing PLKSDA-BM in a participatory manner and the application of *agroforestry* technology in Nagari Tanjuang Bonai, Lintau Buo Utara District, Tanah Datar District, has proven to have a positive impact on increasing household income of the community, thus this concept needs to be replicated in other locations.

To solve the problems faced by farmers in implementing the program in the future it is expected that the physical development of facilities and infrastructure need to be established.

Enhancing empowerment of farmer group critical land managers from institutional aspects, partnerships, conservation and increase of agricultural production and development of agribusiness / agro-tourism in order to increase farmer income and welfare is required to increase the ability of farmers to finance critical land management to support the sustainability of the program. The availability of capital and production facilities need to be solved by farmer group itself, Nagari government and district government.

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